DOCUMENT RESUME

ED 254 640 CE 040 825

AUTHOR Moreby, D. H.
TITLE Computer Literacy for UK Shipping Management Ashore and Afloat. A Summary. FEU/PICKUP Project Report.
INSTITUTION Further Education Unit, London (England).
REPORT NO ISBN-0-946469-97-0
PUB DATE Jan 85
NOTE 25p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Adult Education; *Business Administration; Business Education; *Computer Literacy; Computer Oriented Programs; Continuing Education; Curriculum Development; *Educational Needs; Interviews; *Management Development; Needs Assessment; Postsecondary Education; Training; Workshops
IDENTIFIERS *Shipping Industry; *United Kingdom

ABSTRACT

A study assessed the need of various levels of management in the shipping industry of the United Kingdom for computer literacy training. During the study, researchers interviewed managers in eight shipping companies identified as using computers, spoke with managers and consultants from five companies actively engaged in designing and installing computer systems in the shipping industry, and conducted pilot workshops involving some 70 serving ships' officers and 35 practicing shipping managers. Data collected from these individuals indicated that computers are currently used in many phases of the shipping industry, including voyage estimation and analysis, crew and personnel management, cargo and passenger booking and documentation, chartering, container operations and tracking, vessel maintenance, cargo operations, and shipboard training. Fear and misunderstanding of the function and impact of computerization of operations were found to exist at all levels of management. Recommendations were made for the provision of short-term training courses in computer literacy for managers both ashore and afloat. It was determined that senior managers be trained in assessing competing computerized systems in light of company needs, middle managers be trained in strategies for solving problems arising during implementation of new computer systems, and junior managers be trained in understanding operational applications of computers. (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED254640

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

COMPUTER LITERACY FOR UK SHIPPING MANAGEMENT ASHORE AND AFLOAT

A Summary

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Mansell

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PICKUP

PICKUP (Professional, Industrial and Commercial Updating) is an initiative by the Department of Education and Science to stimulate the updating role of education and the part colleges, polytechnics and universities can play in meeting the needs of business for post-experience education and training. Regional PICKUP agents provide liaison between academic institutions and employers.

PICKUP Regional Development Agents

Eastern Counties
Tony Winkless
PICKUP Office
Cambridge College of Arts and Technology
Collier Road,
Cambridge CB1 2AJ. Tel: 0223 352900

East Midlands
Ronald Arnfield
PICKUP Office
East Midlands Further Education Council
Robins Wood House
Robins Wood Road
Apsley
Nottingham NG3 3NH Tel: 0602 293291

London and Thames Valley
David Thomas
PICKUP Office
Oxford Polytechnic
Headington, Oxford OX3 0BP Tel: 0865 60264

North East and Cumbria
Neil Ellidge
PICKUP Office
Allendale
Newcastle Polytechnic,
Coach Lane Campus
Coach Lane, Newcastle upon Tyne
Tel: 0632 663345

North West
David Esther
PICKUP Office
Woodlands Centre
Southport Road, Chorley
Lancashire PR7 1QR. Tel: 02572 75474

South East
Don Jarvis
PICKUP Office
Kingston Regional Management Centre
Kingston Polytechnic
Kingston Hill
Kingston upon Thames. Tel: 01-541 0209

South West
David Roskilly
PICKUP Office
Bristol Polytechnic
Coldharbour Lane
Frenchay
Bristol S16 1QY. Tel: 0272 659075

West Midlands
Paul Tranter
PICKUP Office
Wolverhampton Polytechnic,
Compton Park Site
Compton Road West
Wolverhampton WV5 9DX. Tel: 0902 24286

Yorkshire and Humberside
John Geale
PICKUP Office
Yorkshire & Humberside Association for
Further & Higher Education
Bowling Green Terrace
Leeds LS11 9SX. Tel: 0532 438634

Welsh PICKUP Development Agent
Ian Roffe
PICKUP Office
Polytechnic of Wales
Pontypridd
Mid Glamorgan CF37 1DL. Tel: 0443 493696

FEU / PICKUP

PROJECT REPORT

COMPUTER LITERACY FOR UK SHIPPING MANAGEMENT ASHORE AND AFLOAT

A Summary

Dr D. H. Moreby
Faculty of Maritime Studies
Plymouth Polytechnic

Further Education Unit

Professional, Industrial and Commercial Updating

BEST COPY AVAILABLE

ISBN 0 946469 97 0
January 1985

© Further Education Unit (FEU) 1985
Reproduction in whole or in part of the contents of this publication is authorised for all non-commercial educational purposes, provided the source is acknowledged.
All rights reserved with regard to commercial reproduction of the contents.

Printed by Silverdale Press Ltd., Hayes, Middlesex

FURTHER EDUCATION UNIT

Elizabeth House York Road London SE1 7PH Telephone 01-928 9222 ext

Chairman: J G Owen CBE

Chief Officer: Jack Mansell MEd CEng FIEE MIMarE

Chief Education Officers
Principals of FHE Establishments
Secretaries of Regional and FE
Examining Bodies
Press and other Interested
Institutions/Individuals

Dear Sir/Madam

COMPUTER LITERACY FOR UK SHIPPING MANAGEMENT ASHORE AND AFLOAT - A SUMMARY

I enclose a summary of the above document based on a PICKUP* project of the same title and carried out on our behalf by Plymouth Polytechnic.

The summary is primarily aimed at course designers and providers dealing with courses in the operational and commercial systems in the shipping industry. The main theme is that against a background of computer illiteracy in the industry, Computer Literacy is a necessary skill for personnel in the UK shipping industry; and that effective training and educational provision is necessary to enable personnel to adjust to changes. The report identifies both the functions in the industry affected by computer-related technology and the anxieties of personnel whose jobs are changed by the application of computers. An understanding of this background should contribute to more effective provision of training and education. Colleges related to the shipping industry are recommended to provide suitable short courses.

The information was collected through interviews and pilot workshops of practising shipping managers. Thus, the document should form a foundation for identifying the needs of personnel. Following from this, curricular areas are mentioned to give further guidance for effective provision for shipping managers. We hope that the report will contribute to the introduction of computers, otherwise the report implies that the UK shipping industry will be at a disadvantage in a highly competitive international market.

FEU policy is that all personnel should be competent in Computer Literacy** since it may be regarded as the basis for Information Technology. We see this document as a confirmation of that policy.

Yours faithfully

Jack Mansell

JACK MANSELL
Chief Officer

* PICKUP is the Department of Education and Science Professional, Industrial and Commercial Updating programme to meet the mid-career updating needs of adults in employment.

** Computer Literacy Parts 1/2 (FEU) 1983, re-issued 1984 in four units.

A Company limited by guarantee. Registered Office: Elizabeth House, York Road, London SE1 7PH. Registered Number 1028782 England

BEST COPY AVAILABLE

CONTENTS

Section		Page
I	INTRODUCTION	1
II	OBJECTIVES	2
	Scope of the Research	2
	Methodology	2
III	FINDINGS	4
	Computer Usage in Shipping	4
	Illiteracy and Fear	7
	Age and Resistance to Change	9
IV	EDUCATIONAL PROVISION	11
V	CONCLUSIONS AND RECOMMENDATIONS	13
	Training Needs	13
	The Short Courses offered by the Project Team	13
	Reactions to the Short Courses	14
	Guidelines for Training	14
	Provision of Training	15
	Further Study	16

BEST COPY AVAILABLE

I INTRODUCTION

1. The rapid developments in computer technology which have taken place over the past few years have, until comparatively recently, received scant attention from the UK shipping industry. While there appears to be wide-spread acceptance of computerised accounting and financial systems among shipping companies, the same cannot be said of operational and commercial systems such as planned maintenance and inventory control.

2. The industry does not exist in isolation, however, but in a fiercely competitive international arena which tends to favour the operator with the lowest total costs. Therefore the UK industry must either make use of the new technology on its own volition, or find itself at a disadvantage from competitors who do use it. In either eventuality, there will be managers in mid-career, both ashore and afloat, who will have to come to terms with computer technology. This project is concerned with the appreciation and use of the new computer technology by those managers in mid-career in the UK shipping industry for whom computer illiteracy will soon be unthinkable.

BEST COPY AVAILABLE

II OBJECTIVES

3. The overall objective has been to demystify for personnel, computers and their usage in shipping, and to determine what computer literacy courses are necessary, at each level of management, ashore and afloat. This requires that the following be identified:

(i) Who and where are the current computer users in shipping?

(ii) Where are computer illiterate people to be found in the UK shipping industry?

(iii) At whom should computer courses be aimed?

(iv) The design and content of courses aimed at improving computer literacy among UK shipping managers, both ashore and afloat.

Scope of the Research

4. The research focused on computers used for ship operations, including ship stability, cargo operations, ship scheduling, container tracking and voyage analyses. It specifically excluded the use of dedicated navigational and engine-control microprocessors and computers used for financial and accounting purposes.

Methodology

5. The first task was to identify the purposes for which computers are being used in shipping, and by whom. This was achieved mainly by surveying contemporary literature, running pilot workshops and holding interviews with shipping managers. The workshops involved some 70 serving ships' officers and 35 practising shipping managers.

6. A programme of interviews was then undertaken with managers in eight companies which had been identified as computer users: this was

---

(1) Computer literacy for UK shipping management ashore and afloat FEU, (1984) Full report available from FEU.

BEST COPY AVAILABLE

supplemented by interviews with managers and consultants from five companies actively engaged in designing and installing computer systems in the shipping industry. Valuable insights were gained from listening to the experiences of managers who had instigated computer systems, been involved with implementation or, in some cases, had opposed the introduction of computerised systems.

7. At this juncture, members of the Plymouth Nautical Graduates Association ('PYNDA'), currently employed within the shipping industry were invited to participate in a workshop to discuss some of the findings and to explore possible solutions. This proved particularly valuable since the discussions not only confirmed and elucidated the findings but also revealed enthusiasm for an industry-wide attempt to tackle the problems facing UK shipping.

8. The final task was to design appropriate computer literacy courses or workshops, by level of management, ashore and afloat. In the light of the PYNDA workshop experience, it was decided that this could best be assisted by promoting an industry-wide dialogue through the medium of a public forum. A one-day conference, attended by 74 shipping managers, was held in London with a combination of guest speakers from industry and members of the project team addressing the issues which had been identified. The conference was supplemented by an exhibition of computerised systems designed explicitly to meet the needs of the shipping industry.

BEST COPY AVAILABLE

III FINDINGS

Computer Usage in Shipping

9. The most prevalent feature of computer usage in UK shipping is the distinct lack of inter-company uniformity. No two companies, even if engaged in similar business activities, attach the same priority to computerising a given operational function. The consequence is that any attempt to list those functions which have been successfully computerised may give the impression that computer usage in UK shipping is well developed. This is not the case, since many of the applications already in use are isolated examples of computer systems. None of the companies visited had computerised all the functions appropriate to their business. Furthermore, even where more than a single application was in use, logical integration of obviously related functions had been ignored. These limitations should be kept in mind when drawing inferences from the following resumee.

Voyage Estimation and Analysis

(i) Widely available from a variety of shipping software vendors, voyage estimation and analysis packages have varying degrees of sophistication. Most take account of vessel detail, multiple port loading/discharge and inter-port distances to produce voyage estimates and budgets. Refinements include tailoring software packages to the needs of particular trades.

Crew and Personnel Management

(ii) All the companies visited made use of some form of Personnel Management System, either in-house or from a computer bureau, all of which offer similar storage and retrieval of personnel information such as educational background, professional qualifications, employment record, home address, next of kin and dates for vacation or re-appointment. Crew payroll modules are available and are normally integrated with the shore payroll system.

BEST COPY AVAILABLE

Cargo and Passenger Booking and Documentation

(iii) Most aspects of cargo and passenger booking/documentation can be and, in some cases, are being performed on-line. The facilities include freight documentation, invoicing, planning, passenger ticket, car reservations, space availability, accounts and statistics.

Chartering

(iv) Charters typically involve three separate parties - shipowner, charterer and shipbroker - all of whom have similar information requirements yet who, because of their negotiating positions, separately collect, retain and display the information on their separate computer systems. There is a wide range of software packages for chartering and most take account of, e.g. vessel and cargo positions, fixture records, fixture details, vessel performance, demurrage calculations and commissions.

Container Operations and Tracking

(v) Computerised container operations and tracking systems, designed for use by shipping companies, track interport - and, in many cases, overland - movement of both owned and leased containers. Typical reports include port and vessel inventory, port turnaround, slow moving containers, damage and repair registers. In addition, some systems offer the facility to track trailers and other container handling equipment.

Vessel Maintenance and Spare Parts Inventory Control

(vi) This application has received much attention from the vendors of shipping software, since planned maintenance is relatively easy to computerise and spare part control produces a benefit to the shipowner that is easily quantifiable. Owners are able to see the justification for purchasing a computerised system to handle these aspects of ship operations.

BEST COPY AVAILABLE

Cargo Operations

(vii) Packages are available which duplicate the functions usually performed on dedicated loading/stress calculators as required by the 1968 Load-Line Rules. Owing to the continued depression in the shipping market, there has been little new building activity for UK owners' accounts since the advent of such packages and, consequently, little stimulus to purchase them.

Ship Scheduling and Performance Monitoring

(viii) Optimal schedules for a fleet of vessels, both long and short term, can be performed by packages currently in use. Estimates of optimal speed can be produced which take into account such factors as load and ballast situations, hull roughness and fuel oil loss due to machinery condition.

Shipboard Training

(ix) Used throughout the fleet of tankers owned by a major oil company, shipboard training packages cover many areas of ship operation, maintenance and planning. The modules which cover operational procedures of cargo handling equipment or main and auxilliary machinery actually mimic the operation concerned and can, therefore, be tailored to match the particular equipment on board the ship where training is taking place.

Technological status

(x) Most of the applications described above are available in packages for use on various hardware configurations from the small business microcomputer through so-called mini-systems to the large mainframes either in-house or time-shared. Where computer systems are installed aboard ship they are invariably microcomputer based and often duplicated ashore in Head Office. An alternative arrangement is to have micros on board ship with a large, but compatible, mini or mainframe ashore to act as

BEST COPY AVAILABLE

systems master. The advent of maritime satellite communications has generated some interest in using this medium to link compatible computers ashore and aboard ship. This is one of the few areas where the full capabilities of the technology have been put to use. Other techniques such as computer-graphics are rarely seen in UK shipping, the notable exceptions being colour-graphics in a computer-aided training package and graphical displays in some ship loading systems.

Illiteracy and Fear

10. The interviews revealed that two levels of computer illiteracy are to be found among managers in the UK shipping industry, each of which is epitomised by one of the following two statements: 'My job is so complex that it could never be computerised' and 'Computers are marvellous - they can do anything'. Interwoven with these attitudes are a plethora of fears and misgivings. Those most frequently encountered include:

Forgetting how to think

(i) In essence, the same argument that was used to oppose the use of pocket calculators in the mid-1970's is being used to oppose the introduction of computers i.e. human beings are naturally lazy and, once a task is computerised, people will forget how to perform the task manually with the result that the company or a department will grind to a halt should the computer break down. While it may be possible to dispute this view, it may be imprudent to ignore it completely.

Loss of permanent records

(ii) The belief that computers will, in some way, corrupt or lose forever the information which they store, manifests itself in managers refusing to acknowledge the redundancy of certain paper records and data collection forms. Fear of a temporary

ST COPY AVAILABLE

system failure results in managers insisting on the maintenance of paper records. The beliefs which underpin the fear of loss of paper records have two causes and associated remedies. Some managers believe that all information on all aspects of their department's function must, at all times, be available for immediate decision making when, in reality, a delay can be tolerated during system down time. The remedy lies in a realistic appraisal of the department's function and information needs. The second cause of fear (i.e. total loss of records) is rooted in real experiences with earlier generations of computers which, from time to time, did have serious malfunctions. The remedy lies in educating managers to appreciate modern computer technology and to demand requisite fail-safe provisions from the hardware and software vendors.

Breaking the system

(iii) Closely allied with the fear that the computer would corrupt or lose data of its own volition is the fear that the user may bring about a similar effect through inept manipulation of the keyboard. This fear can be attributed to lack of 'hands-on' experience and to lack of computer appreciation. It is best overcome by encouraging practising managers to attend computer appreciation courses in a 'risk-free' environment, as demonstrated by the success of the computer short-courses which stemmed from this project.

Unemployment

(iv) By far, the most common fear expressed by those interviewed was that computers have caused or will cause unemployment. The experiences of current computer users in UK shipping do not support these fears. Indeed, many commented that, in the short-term, there had been a small increase in staff through the creation of a computer-services department or through the recruitment of specialist data-entry personnel. The long-term effect is unquestionable: computerised systems permit extra work

BEST COPY AVAILABLE

loads, resulting from business expansion, to be handled by existing staff without increasing staff numbers which would have been the case had manual systems still been employed.

'Big Brother'

(v) Perhaps the most emotive fear of all is that experienced as 'being watched by big brother'. The essence of this fear is the feeling of managers that the computerised systems will expose them to critical eyes, especially where the introduction of integrated systems permits managers in other departments, and senior executives in the company, to access departmental information and decisions. In some shipping companies, managers of operational departments fear that they are being overlooked by the accounts department. Fundamentally, this fear is bound up with the issue of management status both ashore and aboard ship. The issue of fear from 'big brother' and management status are intimately interwoven. They have little to do with the introduction of computer technology are more related to the organizational and managerial styles of the companies concerned.

Age and Resistance to Change

11. It could be expected that resistance to computers would be most pronounced amoung the older managers. Indeed this certainly did appear to be the case among the shore based managers. Older managers (e.g. people of 55+ years of age) had apparently preconceived ideas about computers which were extremely difficult to change. Further investigations revealed, however, that instead of being preconceived many of the attitudes held by older managers were based on bad experiences with earlier generations of computer.

12. Experiences gained by the project team at the workshops attended by serving ships' officers helped to refine the issue of age and resistance to change. The older officers who, in this case, were aged 30 and above were aware that computers are going to affect both the working and social aspects of their lives. Some expressed their

BEST COPY AVAILABLE

personal inability to use or appreciate computer applications as something of a professional handicap. Indeed, one third of the senior officers who participated in the exploratory workshops already owned - or had intentions of buying - personal microcomputers.

13. The reactions of younger officers (in the age range of 22 to 28) were quite different from those of the older officers. The younger participants at the workshops tended to reject the notion that computerisation was going to affect the way in which ships were operated and controlled and, furthermore, rejected the need for them to become computer literate.

14. This difference between the attitudes of older and younger ships' officers to computers was confirmed at the public conference by representatives of UK shipping companies which had installed computerised systems.

BEST COPY AVAILABLE

IV EDUCATIONAL PROVISION

15. Although ships' officers already spend some time ashore in nautical colleges attending courses leading to professional qualifications, it would as yet be difficult to include computer training in these courses. They are seen by officers as primarily enabling them to meet the requirements of the professional examining body, the Department of Transport (D.Tp). Since many of the officers pay their own tuition fees, any attempt to include computer training is bound to be resisted unless the D.Tp. decide to include computer usage in their examinations. However, some progress has now been made by the introduction of computer programs to supplement the teaching of ship stability and stresses to officers on the professional D.Tp. courses. These programs enable the student to produce:

(i) GZ curves for commercial vessels and to modify the curves by shifting the Centre of Gravity (G) and the displacement of the vessel.

(ii) GZ curves for box-shaped vessels with the dimensions of the vessels under the control of the student.

(iii) Curves of shear force and bending moments for both commercial vessels and box shapes with the student able to modify cargo distribution.

The work is presented as follows:-

(iv) Students are given written instructions on computer access procedures and are then instructed, in small groups, on how to perform this.

(v) The program package is explained and demonstrated.

(vi) Students are encouraged to use the package to solve their course work problems and to carry out further investigations.

BEST COPY AVAILABLE

(vii) The packages are made available to lecturing staff as an aid during tutorials.

Student reactions have been as follows:

(viii) About 5%-10% of the officer students refuse to have any contact with the computer and show active hostility, even to the extent of refusing to accept the written instructions.

(ix) About 25% of the officer students make serious attempts to use the system.

(x) The remainder (65%) state, that while they can appreciate the use of the system, the effort needed to learn to use the package does not result in sufficient benefits to their courses of study.

There appears to be a reluctance in this age group (24-32) to learn to use the computer as a tool even though there will be cargo-loading computers on their ships when they return to sea. It is worth mentioning that the same group of students readily accept the passive learning of equivalent material from video tapes!

BEST COPY AVAILABLE

V CONCLUSIONS AND RECOMMENDATIONS

Training Needs

16. The interview data clearly suggests that certain managers within the UK shipping industry are mystified by computers. Furthermore, the discussion sessions at the public conference revealed that the patchwork of computer illiteracy, detected in the companies visited during the project, extends throughout the industry.

17. If wider computer literacy is to be encouraged, and implementation of new systems made less difficult (both for companies and individuals), there are education/training implications for managers in mid-career both ashore and afloat. Most of the fears and misgivings expressed to the project team stemmed from a lack of awareness of the nature and limitations of computers: the provision of short courses in general awareness of computers must be given high priority in tackling the problem of computer illiteracy in the UK shipping industry.

18. It is also important for senior managers to have the ability to assess competing systems. Such assessment involves some appreciation of hardware capabilities and a deep understanding of the systems actually required by their companies. The former ability can be taught on a short course; the latter requires years of experience in the shipping industry and a thorough analysis of the company's information requirements.

The Short Courses offered by the Project Team

19. Information gathered during the project persuaded the project team to embark on a particular short-course design that offered a high proportion of 'hands on' experience and little formal lecturing. Statements made at the public conference and experiences gained from running the short courses clearly reveal that senior shipping managers do want to get their hands on computers in a 'risk-free' environment i.e. in a setting where their questions and errors will not be observed by their subordinates and where incompetence on the key board will not break the company's computer.

BEST COPY AVAILABLE

20. Details of the weekend course are given in the full report but included the following topics: Introduction to Microcomputers; Introduction to Visicalc; Use of Appleplot; Applications of Microcomputers to Shipping; the Prime System; Computer Packages and their Applications; Use of SHIP program; Computing in Ship Design.

Reactions to the Short Courses

21. Participants declared a preference for using computers (either a mainframe via terminals or stand-alone micros). Being lectured to came a poor second.

22. One conclusion to draw from this reaction could be that their own physical experience of computers was more meaningful and more easily assimilated that the combined advice of the 'experts' running the course.

23. A potential danger resulting from this attitude, which is not new or peculiar to computing, is that keyboard dexterity might easily be confused with a true understanding of computers. A way of avoiding this pitfall is to continue to let students learn by themselves and then lead them into more sophisticated programs when they can discover for themselves the ability of computers to provide an almost infinite variety of links between items of information (something a filing cabinet system could never do). This approach is planned for future courses.

24. It was gratifying to note that no-one attending the short courses has felt too embarassed to seek guidance. The staff: student ratio on these courses is 1:2 or 1:3 during the practice sessions thus allowing rapid and personal response to any query. Furthermore, the lack of vested interests by the project staff in any particular computer system ensured frank debate and advice.

Guidelines for Training

25. From the research it became apparent that, if the education/training needs are to be effectively met, certain guidelines should be followed:

BEST COPY AVAILABLE

(i) The shipping industry is conservative and is suspicious of advice from outside the industry. Therefore those who are seen as the organizers of any training should command the respect of the industry, be accepted as part of that industry and not be aligned to any one vendor of computer equipment or systems.

(ii) Senior managers, middle managers and ships' officers are all subject to operational pressures when at work. Any attempts to train these managers in computer usage at their work locations are bound to fail owing to frequent interuptions related to their operational duties. Thus training should be provided remote from their place of work.

(iii) The problem of the computer being seen as a threat to managerial status must be avoided at all costs. The ideal solution would be to ensure that computer software used for demonstration purposes required only some working knowledge of the computer function being performed, an ability to read and understand English, and some keyboard dexterity.

Provision of Training

26. During the project, no existing training courses were discovered which met both the training needs, as identified above and the guidelines given in paragraph 25.

27. It is recommended that short courses are designed and implemented for senior and middle managers both ashore and afloat. It is essential that these courses should be mounted by colleges with a good relationship and reputation with the shipping industry and that an extensive range of computing facilities should be available. The courses could be offered over a weekend, taking managers away from their work environment thus freeing them to concentrate on computer familiarisation and the applications of computer technology to the industry.

28. The first series of courses might follow the pattern used by the project team but subsequent courses should be tailored more specifically to the needs of particular groups such as:

BEST COPY AVAILABLE

For senior managers: The assessment of competing computerised systems in the light of company needs and organizational style.

For middle managers: Strategies, implementation problems and solutions when introducting new computerised systems.

For junior managers: Understanding operational applications of computers both ashore and afloat.

Further Study

29. In order to provide more improved courses, further study is required in the following two areas:

(i) Closer examination needs to be conducted into the inter-relationships between organizational style, company information needs and computer systems.

(ii) More research needs to be conducted into implementation strategies, since the manner in which a new computerised system is introudced and implemented affects the attitudes of existing managers. An appropriate strategy can result in wide acceptance of the system; the wrong strategy is bound to be counter productive.

BEST COPY AVAILABLE

FEU

Board of management

Chairman
J G Owen CBE, Chief Education Officer, Devon

Members
J C N Baillie, National Association of Teachers in Further and Higher Education
J Deboo, Confederation of British Industry
E L Ellison, Association of Principals of Colleges
Association of Colleges of Further and Higher Education
R J Hartles, Association of Metropolitan Authorities
R Jackson, Trades Union Congress
J Morris, Association of County Councils
E Norris HMI, Department of Education and Science
L Rees, Welsh Joint Education Committee
Rev Canon George Tolley, Manpower Services Commission
C R Walker, Department of Education and Science

Observers
Dr F D Duffin, Department of Education, Northern Ireland
J Howgego, Scottish Education Department
K McWilliams, School Curriculum Development Committee
P C Webb HMI, Welsh Office Education Department

Secretary
Jack Mansell, Chief Officer, Further Education Unit

Objectives

The objects for which **The Further Education Unit (FEU)** is established are to promote, encourage and develop the efficient provision of further education in the United Kingdom and for that purpose:
a) to review and evaluate the range of existing further education curricula and programmes and to identify overlap, duplication, deficiencies and inconsistencies therein;
b) to determine priorities for action to improve the provision of further education and to make recommendations as to how such improvements can be effected;
c) to carry out studies in further education and to support investigations of and experimentation in, and the development of further education curricula and to contribute to and assist in the evaluation of initiatives in further education;
d) to disseminate and publish information and to assist in the dissemination and publication of information about recommendations for and experiments and developments in further education.

BEST COPY AVAILABLE

FEU

Board of management

Chairman
J G Owen CBE, Chief Education Officer, Devon

Members
J C N Ballin, National Association of Teachers in Further and Higher Education
J Deboo, Confederation of British Industry
E L Ellison, Association of Principals of Colleges
Association of Colleges of Further and Higher Education
R J Hartles, Association of Metropolitan Authorities
R Jackson, Trades Union Congress
J Morris, Association of County Councils
E Norris HMI, Department of Education and Science
L Rees, Welsh Joint Education Committee
Rev Canon George Tolley, Manpower Services Commission
C R Walker, Department of Education and Science

Observers
Dr F D Duffin, Department of Education, Northern Ireland
J Hargego, Scottish Education Department
K McWilliams, School Curriculum Development Committee
P C Webb HMI, Welsh Office Education Department

Secretary
Jack Mansell, Chief Officer, Further Education Unit

Objectives

The objects for which **The Further Education Unit (FEU)** is established are to promote, encourage and develop the efficient provision of further education in the United Kingdom and for that purpose
a) to review and evaluate the range of existing further education curricula and programmes and to identify overlap, duplication, deficiencies and inconsistencies therein;
b) to determine priorities for action to improve the provision of further education and to make recommendations as to how such improvements can be effected;
c) to carry out studies in further education and to support investigations of and experimentation in, and the development of further education curricula and to contribute to and assist in the evaluation of initiatives in further education;
d) to disseminate and publish information and to assist in the dissemination and publication of information about recommendations for and experiments and developments in further education

BEST COPY AVAILABLE